Notebook Series -- Notebooks by Edison
Notebook, N-18-07-24.2

The dated entries in this notebook are from July 1918 and August 1922. The entries for the earlier period may have been copied into the book in 1922. Included are notes copied from N-18-07-18.2, along with abstracts of results from the same source, evaluating various chemical compounds to be used as part of a sound detection device or chalk (phone) electromotograph. The 1922 entries relate to additional experiments performed with chalk phones tested in a variety of circuits, under differing conditions, or using different metallic contacts. The notes indicate that William A. Hayes assisted Edison with these experiments in 1918, while Frederick P. Ott assisted in 1922. The front cover is marked "Chalk Phone" and is labeled "Chalk Phone Fred Ott." The pages are unnumbered. Approximately 30 pages have been used.

Copied from other book

July 24 1918

Tried Exp'mts on Chalk Phone using Strontium Carbonate 21% KOH

With Bell receiver connected to Cylinder Phono by 6" rubber tube 3 Stage Audion Using Band Record 15000 ohms in circuit Edison hears to 30 on box Others listening to Bell phone can only hear 16 18 on box

Have small regular phono reproducer old style Cup Mica dia 15/1000

Using Stethoscope Edison hears no scratch, Hayes says he only hears gears

Kisselgur 16 on box
Tungstate Calcium 18 @ 20 on box too soft - Promising

CENTRAL STATIONERY CO.
12 EAST 16th STREET,
NEW YORK
TO RECORDER USE
ber 22198

Cracks when wet shrinks but still works

China Clay – not a sound
Following tested with limit on
Box = Bell on Box 16 Limit

Kisselghur	16
Tungstate Calcium	20
China Clay	0
Rotten stone	0
Strontia Oxide	4
Lithium Phosphate	Poor
Bismuth Oxide	Poor
Uranate Soda	Poor
Cadmium Oxide	Poor
Magnesia Silicate (Native)	0
W Va Limestone	0
Aluminum Hydrox	30
Lithopone	6
Tungstic Acid	5
Strontium Oxide	16
Mag Amon Phosphate	8
Soda Antimoniate	0
Barium Antimoniate	10
Silica	12
Ferric Ox fm Oxalate	8
Blanc Fix	2

Will not stand much KOH gets soft
" "

Mix of Al_2O_3 + $SrCO_3$	12
Cylinder K Alum	0
Li Ox ignited Oxalate	8
Ferric hydrox	0
Calcium Hydrox	8
Cadmium "	½
Lead "	0
Mercuric "	12
Magnesium "	30
Zinc "	26
Stannous "	0
Cupric "	0
Cobaltic "	5
Ferrate of Barium	0
Manganic Hydrox	0
Magnesium Sulphite	0
Chromic Hydrox	Crumbles
Magnesia Phosphate	12
" Oxalate	4
" Citrate	12
" Acetate	0
Copper Carb	0
Litharge	0

Lead Phosphate	0	
Calcium Ferrocy	28	—
Red Hg Oxide	22	—
Lead Sulphate	0	
Colloid Ferric Hydrox	0	
2 Gy H	0	
Barium hydrox	2	
Light Calcined Magnesia	26	—
Magnesia fluoride	30	—
Calcium Citrate Crumbles	—	
Zinc Ox	12	
Calcium Sulphide	6	
Strontia Salicylate	—	NG
Ferric Borate	8	
Strontia Oxalate	38	=
Carb Magnesia	12	
Barium Phosphate	16	
Calcium Arsenate	26	—
Calcium Oxalate	32	=
" Sulphate	2	
" Chromate	20	—
Zinc Carb	0	
Strontia fluoride	10	
" sulphate	4	
Ferrous Phosphate	14	

Flakes up Considerable Roll
works off

" 30 on bag very strong to 24 - Cracked
smooth -

Batt 16 on 60 ~~Crap shrinks~~ Expt

Crumbles
1 V. Very Loud on short clot

	Magnesium Borate	9
Cracked mercury but OK	Black Stannous Oxide	28–30 —
	Strontium Borate	28 —
	Aluminum Chromate	24
	Bismuth Sub Carb	2
	Ferric Oxalate	0
	Bismuth Oxychloride	0
	Zinc Oxalate	8
	Barium Borate	14
works on light pressure not hard on Zero but 32 on 6 ox	Copper Oxide 5	32 —
	Magnesia Formate	12
hard at Zero – taken Ammonia KOH 6 times req works well after saturation + wiping off quite 20 on 6 ox	Calcium Silicate	34 =
	Peroxide Manganese	0
	Manganese Carb	0
	Lead Per Ox	0
	Iron Sulphide	0
	Barium Arsenate	8
	Strontia Antimoniate	20 —
	Strontia Arsenate	20
	Mangan Borate	14
	Nickel Ox	0
	Lithia Carb	6
	Benzidine Sulph	0
	Amidophenol p –	0
	Anthracene	0
	Naphthalene	0
	Amidophenol Hydrocl	0

The following are the chalks that can be investigated.

Aluminum hydrox	30
Magnesium "	30
Zinc "	26
Calcium ferrocyanide	28
Red Hg hydroxide	22
Light calcined Magnesia	26
Magnesia Fluoride	30
Oxalate Strontia	38
Calcium Arsenate	26
" Oxalate	32
" Chromate	20
Black Stannous Oxide	30
Strontium Borate	28
Aluminium Chromate	24
Copper Oxide	32
Calcium Silicate	34
Strontia Antimoniate	20
Strontia Arsenate	20

Ca salts	5 cases
Sr "	4
Mg "	3
Al	2

Since these tests have been made further tests have been made without Audion with great improvement in sensitiveness, using phonogh Bell receiver as sender & a Amberol Band record.

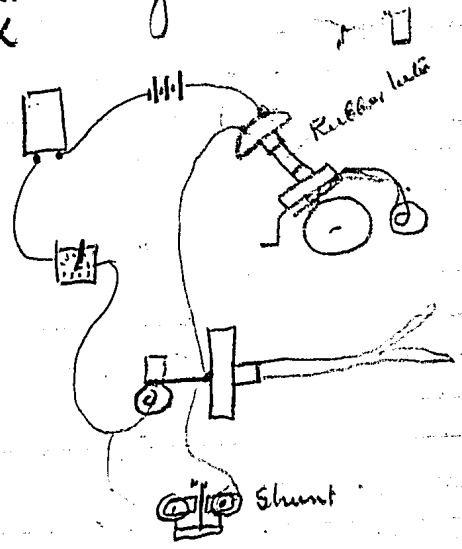
The first improvement was putting a 5 Microfarad Large type Quad Condensers in Circuit and then putting in circuit 7 Cells of storage Battery Cells say 8½ Volts

The next great advance was made by shunting the MgO cylinder contact, with a Quad polar relay. This greatly increased the Sensitiveness, smaller inductance like Brunall Coils not so good.

The next advance was

by putting a insulating rubber sleeve on shaft & using Copper washers so the two end poles of Chalk was Copper some oxidized This increased sensitiveness still more.
Also proved that Palladium was the best pen from Diaphm -

Without audion & these arrangements got 20 on the 6-X



without Condensers or battery using MgO Edison couldn't hear anything on Bell phone

Then arranged it with Condenser + Battery -

Edison hears it Loud but when turn on BOX A to advance one point don't hear it, or anything on Bell

I reverse battery + get nothing hence the Condenser + battery is an advance beyond a certain number of cells in battery it don't increase Volume

Put in a MgO 750 lbs. hydraulic pressure used in making moulded dry no water used porosity greater when moulded dry powder, Takes more KOH + dries quickly - track good without tearing Can hear now on one button from

Zero on No 2

It is best to wet MgO & let it dry before pressure put on Rubber powder to form Track

Our Bell sounding phone is 1100 ohms -

MgO dry moulded at 500 lbs is better than 750 or 400 with 500 lbs heavy To 8 on box
But it is less loud on Zero or No 1 - more porosity is Explanation probably

After Standing on Zero got Considerable more volume but Edison Could not hear beyond #8

Fred Ott tried it & got 24 on box + 12 on Bell Phone This is the 500 lbs MgO.

We dupard the 500 receiver
it was just the same

500 is somewhat softer
and then forms a recess
which makes good contact

with 750 too hard to do this
hence only touches points

Made a 400 heard it to #8

Egerton says 6 points on
box cuts current 1/2
Each notch or point is 1 mile
telephone wire 44 Ohms —
with a Condenser across .054
Mf

We use pieces of rubber sponge
to add KOH to MgO.

Removing the Cells in ckt
Scarcely audible on Zero
point. While battery is in ckt
reversing poles make no change

Thinking polarization may
have some effect at Contacts
with the MgO I put in Copper
Washers forming side of
Mandrill Contacts + put a rubber
sleeve over shaft.

Even with a platina pen which
is 1/2 as loud as Palladium
I hear to 8@10 –

By putting in Palladium
pen Echo can hear to 12 on
Box Think he hears 14
on Zero its Loud + Clear
+ it dont drop so much on
going to NO 2 point

Reversing poles on MgO
Very Little Effect

It seems to want both
poles non polarizable
Ag. Pb Zn Washers poor.

Oxidized face of Copper washer
& scraped part free, platinum
pen & on box -
Reversed poles on Mg Carbon
Load then went low, put back
again regular Carbon Cathode
Hear to #10 -

Think MgO should be 1/8"
longer; Palladium point only
1/16 from edge

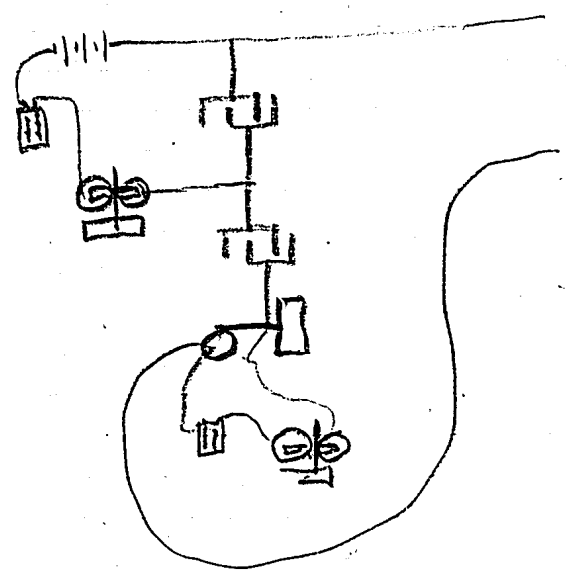
Try using 7 Cells its best.
By putting in a Rounder in
Current weakens very much

By shunting MgO with
polarizer relay from a Quad
it increases sensitiveness
Enormously & hears to # 20

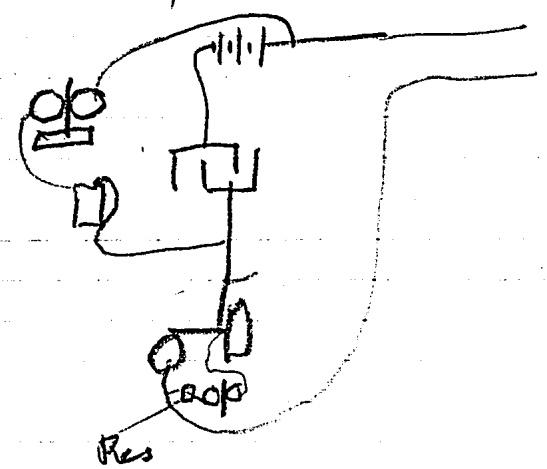
5 Mf on line

Aug 24 1922

Some new ideas to be Tested on Chalk phone



Aug 27/1922



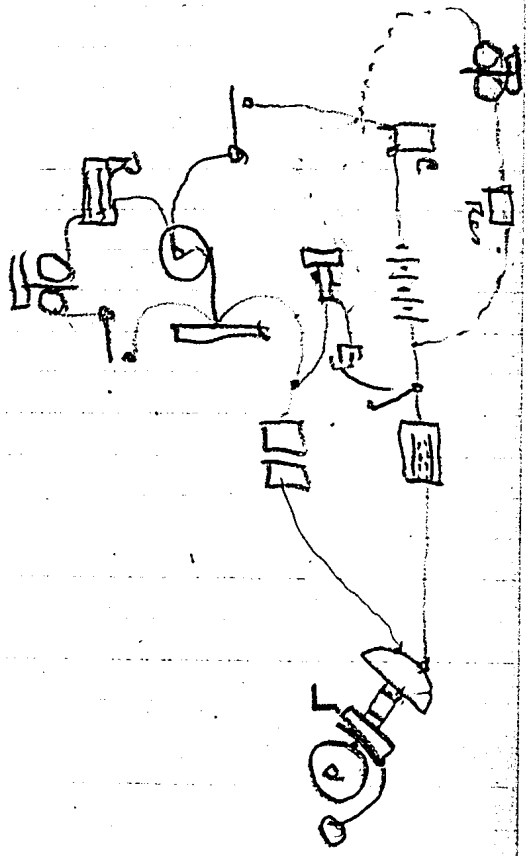
Determine two best Chalk phones in series or Multiple arc by Box

Aug 24 1922

for depolarizing poles against MgO phase

1 Silver with Black Ox
2 Nickel " Ni hydroxide
3 Cobalt " Co perox
4 Copper " Cu hydrox
5 Copper " amalgamated
6 Palladium faced vacuum
7 Platina - platinum black face
8 Palladium + Palladium black
9 Copper Tellurium melted on
10 Copper Selenium "

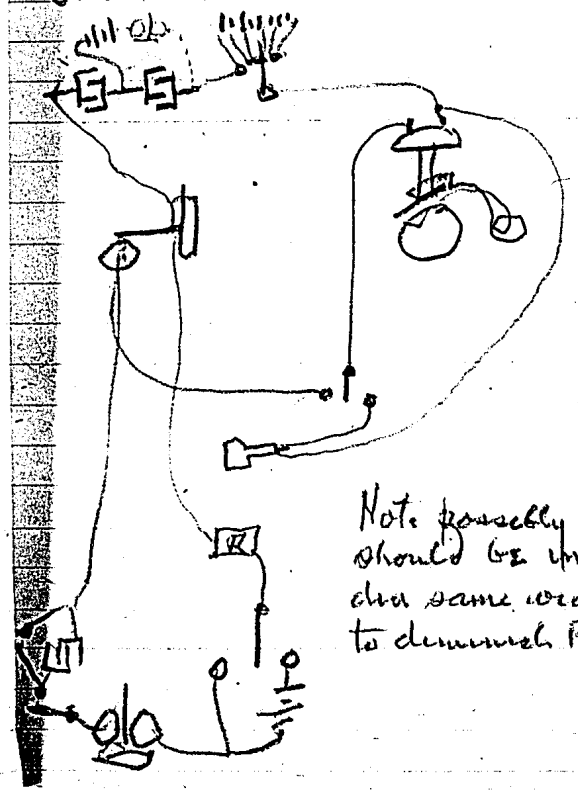
Aug 24 1922



Aug 24 1922

Make a smaller Chalk phone but with diaphram & Cup just like our doc reproducer but dia of chalked paper but .008 .008 .008 .010

Try an Audion bulb to straighten out Current



Note possibly Mg O should be inch dia same width to dummach Resonator

Previous experiments showed that with MgO Condr + Gallery with wet chalk (Cryfer working 1/2 reduced) was put over mercury and in 24 hours could still hear Mercury. KOH probably got carbonated feel sure in closed space air tight + sponge to saturate atmosphere with CO_2 ok for 24 hours at least

Noticed by reversing direction of chalk rotation increased loudness thus shows there is still room for improvement

Finger must not touch MgO as grease destroys action,

Remark

1) Left MgO all night wet cloth very wet. in the morning found some 1/2 Volume by wet it with water & let it dry without pressure on got 3/4 of the Volume of Vacuo, again wet with more water in excess took several minutes to dry then got full Volume of Vacuo, this was with a ~100 gauge pressure of MgO

Try some experiments with Better MgO on boxes with large or small Inc Rec boxes possibly the improvements in some cases is due to lowering Rec of MgO

In welding 500 MgO put more than Req pressure on to form grooves & smoothed track then put to Req pressure

With Condenser & Battery in Circuit reversing poles of MgO makes big difference with Copper washers reversing poles on MgO makes very little difference

We must get non polarizable MgO Contacts apparently

By putting in a Condenser in the General Circuit loudness is very much diminished

Look out that poles of MgO may not get Changed on alternate battery & Effect Subsequent Involving all the Experiments if they do the same must be reduced to Minimum Capacity

Aug 26 1922

Tried MgO Check but it was too heavy at 500 lbs 8" ram — Couldnt get no fuel on Bell phone —

Now will run a series of 6 MgO made on 8" ram at different pressures

1st Trial 100 lbs pressure on 8" Ram.

Next MgO with 2 deps of Rubber Sponges no pressure on let it dry 5 minutes

Fired heavy Bell 14 on box —

Brand Record 6200 Ohms in Line Res

E hears nothing the Cylinder Compressor at the track OK

Shot it twice nothing
twice again nothing
twice again - nothing
put on heavy pressure
Crumbled the MgO

Shoot me 150 lbs on 8" ram
MgO - 4600 Res in
tube — 2 Rubbers full 20% KOH
Let in dry for 10 minutes
before putting on pressure
Edison gets on Zero
Fred OCL on 12
3000 ohm in line
E hears on Zero only
150 lbs makes quinken
back but it is slightly
darkened by weakening of
the Palladium
Its poor

We now put in 200
lb pressure MgO 8" ram
3000 ohms in line

We have in all these Expts
5 2½ Mf Condensers in
multiple & 7 cells A4
in line –

E heavy ~~4~~ on box 1 Gray
Zeno. Fred 18 on box

Bell Fred heavy 20
10 min after Edison 6
on box 3000 Res
No matter with Mag
KOH, Harder pressure
Cannot get above 6
on box ~~3000 Res~~

250 pressure 8" Ram
put pressure on 150
hard before, it got hard
after letting it
Crumbled
3000 Res in line

Now put in 300 lbs
pressure 8" Ram -
I get 8 on 60x feed
gets 22 on 60x
Fred gets 22 on 60x